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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/685,394	10/10/2000	Osamu Yamaguchi	KAW 20089-3	8495

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Richard J. Minnich
Suite 700
1100 Superior Avenue
Cleveland, OH 44114

EXAMINER	
SAVAGE, MATTHEW O	
ART UNIT	PAPER NUMBER
1723	

DATE MAILED: 09/17/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/685,394	YAMAGUCHI ET AL.	
	Examiner	Art Unit	
	Matthew O Savage	1723	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-56* is/are pending in the application.

4a) Of the above claim(s) *4,5,21-24,40 and 55* is/are withdrawn from consideration.

5)☒ Claim(s) *50 and 51* is/are allowed.

6)☒ Claim(s) *1-3, 6-20, 25-39, 41-49, 52-54, and 56* is/are rejected.

7)☒ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-3, 9, 10, 12-20, 31-34, 37-39, 44, 45, 47-49, 53, 54, and 56 are rejected under 35 U.S.C. 103(a) as being unpatentable over Szczepanski et al in view of Pall et al '901 and Ogata et al (U.S. 5,429,745) .

With respect to claims 1 and 56, Szczepanski et al disclose a cylindrical filter (see FIG. 6) including at least two layers of a prefiltration layer 70 and a precision layer 69 disposed in the direction of filtration, each layer being formed with a non-woven fabric with the fibers being bonded to each other at their contact points (see lines 63-68 of col. 4), the diameter of the fibers in the precision layer being smaller than the diameter of the fibers the prefiltration layer. Szczepanski et al fail to specify the fibers of the prefiltration layer as becoming gradually smaller in the direction of filtration. Pall et al discloses the concept of providing a prefiltration layer disposed upstream of a precision filtration layer with the prefiltration layer having fibers that become gradually smaller in the direction of filtration (see example 11, columns 19-20) and suggests that such an arrangement provides high filtration efficiency. It would have been obvious to have modified the filter of Szczepanski et al so as to have included a prefiltration layer arranged as suggested by Pall et al in order to improve the filtration efficiency of the

filter. Szczepanski et al and Pall et al fail to specify the fibers as being bonded by heat treatment. Ogata et al disclose the concept of bonding melt blown fibers of a cylindrical filter by heat treatment method, the filter having fibers that decrease in diameter along a radially inward direction of the filter in either a successive/continuous or step wise manner (see lines 3-11 of col. 4), and suggests that such an arrangement prevents clogging by fluid pressure (see lines 6-31 of col. 5). It would have been obvious to have modified the combination of Szczepanski et al and Pall et al so as to have included fibers bonded by a heat treatment method as suggested by Ogata et al in order to prevent clogging of the filter by fluid pressure.

With respect to claim 38, Szczepanski et al disclose a cylindrical filter (see FIG. 6) including at least three layers of a prefiltration layer 70 and a precision layer 69, and a support layer 68 disposed in the direction of filtration, each layer being formed with a non-woven fabric with the fibers being bonded to each other at their contact points (see lines 63-68 of col. 4), the diameter of the fibers in the precision layer being smaller than the diameter of the fibers the prefiltration layer, and the fibers in the support layer being larger than the fibers in the precision filtration layer and being bonded together (see lines 63-68 of col. 4). Szczepanski et al fail to specify the fibers of the prefiltration layer as becoming gradually smaller in the direction of filtration. Pall et al discloses the concept of providing a prefiltration layer disposed upstream of a precision filtration layer with the prefiltration layer having fibers that become gradually smaller in the direction of filtration (see example 11, columns 19-20) and suggests that such an arrangement provides high filtration efficiency. It would have been obvious to have modified the filter

of Szczepanski et al so as to have included a prefiltration layer arranged as suggested by Pall et al in order to improve the filtration efficiency of the filter. Ogata et al disclose the concept of bonding melt blown fibers of a cylindrical filter by heat treatment method, the filter having fibers that decrease in diameter along a radially inward direction of the filter in either a successive/continuous or step wise manner (see lines 3-11 of col. 4), and suggests that such an arrangement prevents clogging by fluid pressure (see lines 6-31 of col. 5). It would have been obvious to have modified the combination of Szczepanski et al and Pall et al so as to have included fibers bonded by a heat treatment method as suggested by Ogata et al in order to prevent clogging of the filter by fluid pressure.

As to claims 2, 17, 18, 39, 49, Szczepanski et al disclose a prefiltration and precision layers formed of one of polyolefin and polyester fibers (see lines 7-13 of col. 5).

Concerning claims 3, 19, 20, Szczepanski et al and Ogata et al disclose a prefiltration layer formed by a melt blow process.

Regarding claims 9, 14-16, 31, 32, 44, 48, Szczepanski et al, Pall et al, and Ogata et al fail to specify the recited void ratios, however, such a modification would have been obvious in order to optimize the filter for a particular application.

As to claims 10, 33, 34, 45, Szczepanski et al and Ogata et al disclose a melt blow process for forming fibers of the precision filtration layer.

Concerning claim 12, Szczepanski et al disclose non woven fabrics that are different from one another (see lines 41-40 of col. 8).

Claims 13 and 47 recites a process step of making a filter of which carries no weight in an apparatus claim.

As to claim 37, Szczepanski et al disclose the recited support layer 68.

As to claims 53 and 54, Szczepanski et al disclose filter layers that are bonded together (see lines 63-68 of col. 4). In addition, Ogata et al disclose layers that are bonded together

Claims 6-8, 25-30, and 41-43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Szczepanski et al in view of Pall et al and Ogata et al as applied to claim 1, 12, 13, 38 above, and further in view of Barboza et al.

With respect to claims 6, 25, 26, 41, Szczepanski et al and Pall et al fail to specify the prefiltration layer as being a mixture of fibers having different melting points. Barboza et al discloses the concept of providing filtration layers formed of mixtures of fibers having different melting points inherently including a difference in melting point of 10 degrees C or more (see lines 41-65 of col. 7) and suggests that such an arrangement optimizes the filter for particular end-use applications. It would have been obvious to have modified the combination suggested by Szczepanski et al and Pall et al so as to have included fibers as suggested by Barboza et al in order to optimize the filter for a particular end-use application.

Regarding claims 7, 8, 27-30, 42, 43, Szczepanski et al and Pall et al fail to specify the layers as having fibers of different diameters. Barboza et al disclose a filter having layers formed of fibers with different diameters and suggests that the larger

fibers provide structural support for the smaller fibers thereby preventing collapse of the layers (see lines 8-23 of col. 7). It would have been obvious to have modified the combination suggested by Szczepanski et al and Pall et al so as to have included layers of fibers of different diameters as suggested by Barboza et al in order to provide filtration layers that were resistant to collapse. Barboza et al fails to specify the fiber diameter ratios recited in claims 7 and 8, however, such modifications would have been obvious in order to provide the degree of support for a particular application.

Claims 11, 35, 36, and 46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Szczepanski et al in view of Pall et al and Ogata et al as applied to claim 1 and 38 above, and further in view of Miller et al.

With respect to claims 11, 35, 36, and 46, Szczepanski et al, Pall et al, and Pall et al fail to specify a precision filter layer formed of glass fibers. Miller et al discloses the concept of providing a precision filter layer formed of glass (see example 1) and suggests that such an arrangement optimizes the filter for a particular filtering application. It would have been obvious to have modified the combination suggested by Szczepanski et al and Pall et al so as to have included a precision filter layer formed of glass fibers as suggested by Miller et al in order to optimize the filter for a particular application.

Applicant's arguments filed 7-11-03 have been fully considered but they are not persuasive.

Applicant's argument that Szczepanski et al fail to disclose filaments that become gradually smaller in the pre-filtration layer is noted and agreed with, however, such a concept is clearly taught by Pall et al. Applicant argues that Szczepanski et al fail to teach changing the fiber diameter in the radial direction of the filter, however, such an argument is not agreed with since FIGS. 4-6 of the reference clearly show filters having fiber diameters that are changed in the radial direction.

Applicant argues that the Pall et al filter includes fiber diameters that vary along the length of the filter whereas the instantly claimed invention does not, however, such an argument is not considered persuasive since Pall et al fail to expressly the fiber diameter varies along the length of the filter element, and because the instant specification and claims fail to expressly exclude a limited amount of variation of fiber diameter along the length of the filter element.

Applicant argues that Pall et al fail to specify fibrous pre-filtration and precision filter layers that are bonded, however, such a concept is clearly disclosed by Szczepanski et al and Ogata et al.

Applicant's argument that Ogata et al fail to disclose pre-filtration and precision filtration layers is noted, however, such features are disclosed by Szczepanski et al and Pall et al.

Applicant argues that the combination of Szczepanski et al and Pall is improper since Szczepanski et al disclose a pre-filtration layer that is bonded whereas a lack of fiber to fiber bonding is essential to the invention of Pall et al, however, such an argument is not considered persuasive since the functional advantages of a graded pre-

filtration layer as disclosed by Pall would not be rendered inoperative by the inclusion of a sufficient amount of fiber to fiber bonding required to reduce clogging under fluid pressure as suggested by Szczepanski et al and as taught by Ogata et al.

Applicant argues that there is no suggestion to combine Szczepanski et al and Ogata et al, however, it is held that such a combination is proper since both references disclose filters formed of wound thermoplastic fibers that are thermally bonded to one another.

Applicant argues that there is no motivation to combine Barboza et al with Szczepanski et al, Pall, and Ogata et al, however, it is held that such a combination is proper since all of the references are directed to filters formed of wound thermoplastic fibers, and because Barboza et al discloses the concept of providing filtration layers formed of mixtures of fibers having different melting points inherently including a difference in melting point of 10 degrees C or more to optimize the strength the filter for particular end-use applications.

Applicant argues that Barboza et al teach providing support fibers of a larger diameter that that of the filtration fibers and is therefor directed to subject matter that is different from the claims at issue, however, such subject matter is clearly applicable to instant claims 7, 8, 27-30, 42, 43 which recite the filter layers as having fibers of differing diameters. Applicant's arguments that Barboza et al fail to disclose the diameter ratios is noted, however, such modifications would have been obvious in order to optimize the strength of the filter for a particular application.

Applicant's argument that Pall et al and Barboza et al cannot be combined is not considered persuasive since the functional advantages of a graded filtration layer as disclosed by Pall would not be destroyed by fiber to fiber bonding.

Applicant argues that the combination of Miller with Szczepanski et al, Pall et al, and Ogata et al is improper, however, it is held that the combination is proper since all of the references are directed to cylindrical multi-layered filter mediums.

Claims 50 and 51 are allowable over the art of record.

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew O Savage whose telephone number is 703-308-3854. The examiner can normally be reached on Monday-Friday, 7:00am-3:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wanda W. Walker can be reached on 703-308-0457. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

M. Savage

Matthew O Savage
Primary Examiner
Art Unit 1723

mos
September 16, 2003